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**THE MANITOBA ELECTRICAL MUSEUM
AND EDUCATION CENTRE**

by Lindsay Ingram

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Abstract

This paper tells the story, briefly, of the development of the Manitoba Electrical Museum and Education Centre in Winnipeg, from the original initiatives in 1971, through the years of collecting artifacts, to the acquisition of a suitable building and its opening as a museum in December 2001. It is a story of what a band of determined and knowledgeable volunteers can do to help preserve a major aspect of the engineering history of their province, how their determination survived over such a long period, and the help they received from corporate sponsors. It describes the main exhibits currently on show, and provides a bibliography of sources for those who wish to continue to study the engineering history of Manitoba. The author is one of the volunteers.

About the Working Paper Series

In June 1995 the Council of the Engineering Institute of Canada agreed that Working Papers on topics related to its history and development, to the history and development of other institutions serving the engineering profession in Canada, and to engineering generally should be published from time to time.

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The editors of this present Working Paper were Peter R. Hart and Andrew H. Wilson

About the Author

Lindsay Ingram was born and raised in Edinburgh, Scotland, where he graduated in electrical engineering from the Heriot-Watt College in 1945. During that same period in World War II, he completed an indentured apprenticeship with a major electrical manufacturer. After the War, he worked for Edmunson's Electric Utility Company in England as a junior engineer. In 1947, he took up employment with the Kuwait Oil Company in the Persian Gulf, where he remained for four years. When his contract expired, he emigrated to Canada and was hired by the fledgling Manitoba Hydro-Electric Board (now Manitoba Hydro) where he worked for the next 33 years, retiring in 1984 as the director of the System Planning Division. During his time with Hydro, he attended the Westinghouse Advanced School in Electric Utility Engineering at Pittsburgh in 1961 and the Banff School of Advanced Management in 1974. For several years after retirement, he worked as an engineering consultant.



Lindsay is a life member of the Association of Professional Engineers and Geoscientists of the Province of Manitoba, a life member of the Engineering Institute of Canada and the Canadian Society for Electrical Engineering (now IEEE Canada), and a life senior member of the Institute of Electrical and Electronics Engineers. He was a member of a working group of CIGRÉ (*Conseil International des Grands Réseaux Électriques*) and authored, co-authored and presented several technical papers over the years. He was a co-recipient in 1981 of a Certificate of Recognition from the Minnesota Society of Professional Engineers for his contributions to the 500kV Winnipeg-Minneapolis transmission line project.

Currently, Lindsay is actively involved as a volunteer and vice-president of the Manitoba Electrical Museum and Education Centre. He is also secretary of the EIC Life Members' Organization's Winnipeg Branch.

Introduction

Mention the word 'museum' to most residents of Winnipeg and they will probably think first of the well-known Manitoba Museum (previously called the Manitoba Museum of Man and Nature). If pressed, they might recall the Western Canada Aviation Museum or perhaps the Dugald Costume Museum. It is doubtful if many can identify the more than 20 museums in the Greater Winnipeg area. Heritage Winnipeg, in its *Directory of Heritage Organizations, Attractions and Resources*, lists them all, as well as the numerous historic houses, archives and libraries that help to preserve the history of Manitoba.

In spite of the dedicated work of volunteers and professionals in this field, there is one segment of Manitoba's history that, until recently, has received very little attention. The electrical industry is aware that Manitoba is truly a hydroelectric province. An abundance of clean, renewable water power in an area lacking coal, natural gas or oil encouraged widespread use of electricity - initially in streetlights, streetcars and industry, then in the home and, finally, on the farm. There are few places in the world where people make more use of electricity, and even fewer where they pay less for it. Despite this, little has been done to preserve those things associated with our electrical heritage, which began in earnest in 1882 when the first street lights over a part of Winnipeg's Main Street were switched on.

The Collection

Taking note of this need in 1971, employees and retirees of Manitoba Hydro¹ formed a Historical Interest Committee to collect and restore materials pertaining to the early electrical history of the province. Modest publicity in employee and customer publications turned up a veritable flood of pictures, books, catalogues, manuals and industrial codes. Meter readers and wiring inspectors reported antique appliances and pieces of equipment they had encountered, while storekeepers welcomed the opportunity to clear obsolete materials from their records. Many customers offered old appliances still operable but no longer in use.

¹ The main corporate cornerstones that formed today's (2003) Manitoba Hydro were:

- * Centra Gas (private), 1873-1999, **126 years**
- * Winnipeg Electric Company (private), 1892-1952, **60 years**
- * Winnipeg Hydro (city owned), 1906-2002, **96 years**
- * The Manitoba Power Commission (provincially owned), 1919-1961, **42 years**
- * Manitoba Hydro (earlier called the Manitoba Hydro-Electric Board) (provincially owned), 1951-present, **52 years**

It should also be noted that the Manitoba Power Commission was created in 1919 to distribute power to the people of the province, while the Manitoba Hydro-Electric Board was created in 1951 to generate power for distribution by others. Both were Crown corporations. After 1961, when they were brought together as Manitoba Hydro, they had a common purpose.

Adequate storage was a problem. Initially, the items were accumulated in an unused building in Transcona, but this proved to be a temporary arrangement. When that property was sold, everything was moved to the basement of a former Manitoba Telephone System building on Ness Avenue in St. James that Manitoba Hydro had acquired. The space available was inadequate and moisture and humidity took their toll on some of the artifacts. When surplus mobile buildings became available after the completion of the Long Spruce Generating Station, space was secured at Manitoba Hydro's Waverley Service Centre yard in Fort Garry. Since 1980, this has provided workshop and storage space of almost 3000 square feet, and is still in use. Additional storage for large items is presently in use on Hervo Street, close to the Service Centre.

Most of the items have been donated but, in a few cases, token payments have been made. All donors receive a certificate of acknowledgement, while plaques are attached to the larger items identifying their sources. A large assortment of antique electrical equipment was received from the Electrical Engineering Department of the University of Manitoba, including an Edison direct current bi-pole dynamo that carries an 1879 patent plate. Believed to be the oldest piece of electrical equipment so far found in Manitoba, it is similar to units on display at the Edison Museum in Fort Myers, Florida, USA. The provincial Government Services Department turned over a collection of well-preserved old test instruments, some of which predate World War I. Westinghouse Canada presented an assortment of meters, while old switchboard panels have been acquired from Canada Cement and Dominion Malting plants.

As might be expected, a major part of the collection to date consists of household appliances. One of the most interesting is a 1911 electric range manufactured in Winnipeg and still in good working order. It was spotted by a meter reader in Selkirk. A local auction house provided a Beatty wooden tub 'Whitecap' washer of 1922 vintage, while any number of General Electric monitor top refrigerators from the 1930s are listed. In the small appliance collection are a variety of electric irons dating back to the early 1900s, and toasters shown in Eaton's 1921 catalogue. There are some unique items no longer seen in today's world - such as an electric presser for creasing men's pants while they were being worn, an electric tie presser, and a wiener cooker that allowed an electric current to pass through the meat until it was cooked. One wonders how some of these items would meet today's safety code requirements!

Due largely to the efforts of H.W. (Bill) Blake, a retired city of Winnipeg Hydro Meter Department superintendent, there is a great array of every type of meter, including a wide range of conventional watt-hour ones and various types of indicating and recording meters. Of special interest is a coin-operated kilowatt-hour meter, once fairly common in Manitoba and still widely used in Europe. Switchboard instruments rated at 3000 amperes and 250 volts remind us of the days when direct current was in common use.

In the document section of the collection are old catalogues, instruction, maintenance and operating manuals, and electrical code books dating back to the turn of the last century, as well as drawings of the first Manitoba Power Commission 66kV transmission line from Winnipeg to Portage la Prairie. Provincial and federal reports, dated 1913-1915, on future choices for hydroelectric

development are also included, as is a private report, dated 1916, by L.E. Myers for the Samuel Insull Company of Chicago, that investigated the possibility that the Insull 'empire' might extend its power interests into rural Manitoba. These reports helped convince the government to form the Manitoba Power Commission in 1919.

The wealth of photographs collected include some of Manitoba's first utility grade hydroelectric power plant on the Little Saskatchewan River, nine miles west of Brandon, and rated at 600kW. Commissioned in 1901, it was probably one of the earliest in Western Canada and helped to provide back-up electricity to that city until 1925. In addition, there are pictures of the steam power plant on Assiniboine Avenue in Winnipeg, dating from around 1900, and of the major pioneer hydro plant at Pinawa on the Winnipeg River that went into operation in 1906. The final rating of the Pinawa plant was 22,000 kW.

The Museum Building

For so many years, none of the items mentioned above were available for public display because the temporary facilities were unsuitable. Then, in December 1993, the volunteers' prayers were answered when Manitoba Hydro provided a real museum site in the form of a 'retired' substation building located at 680 Harrow Street, adjacent to the Hydro head office on Taylor Avenue. The building and the high voltage switchyard were built in 1931 to bring electricity into south Winnipeg from the new Seven Sisters Generating Station on the Winnipeg River. At that time, it was called the Fort Garry Station. Electricity was distributed locally from there and, later, was transmitted to rural and suburban areas. The control room was manned 24 hours a day.

With the passage of time, the local distribution circuits and switchgear had been removed and alternative supplies provided. Modern automation and remote control facilities eliminated the need for control room staffing, leaving a floor space of some 5500 square feet available on two levels for the new museum. Since the outside high voltage station is still in use, part of the building - such as the original control room - is off-limits to visitors, but this is an advantage because they can still observe through glass windows how things were done in the old days. It is just like a "working" museum.

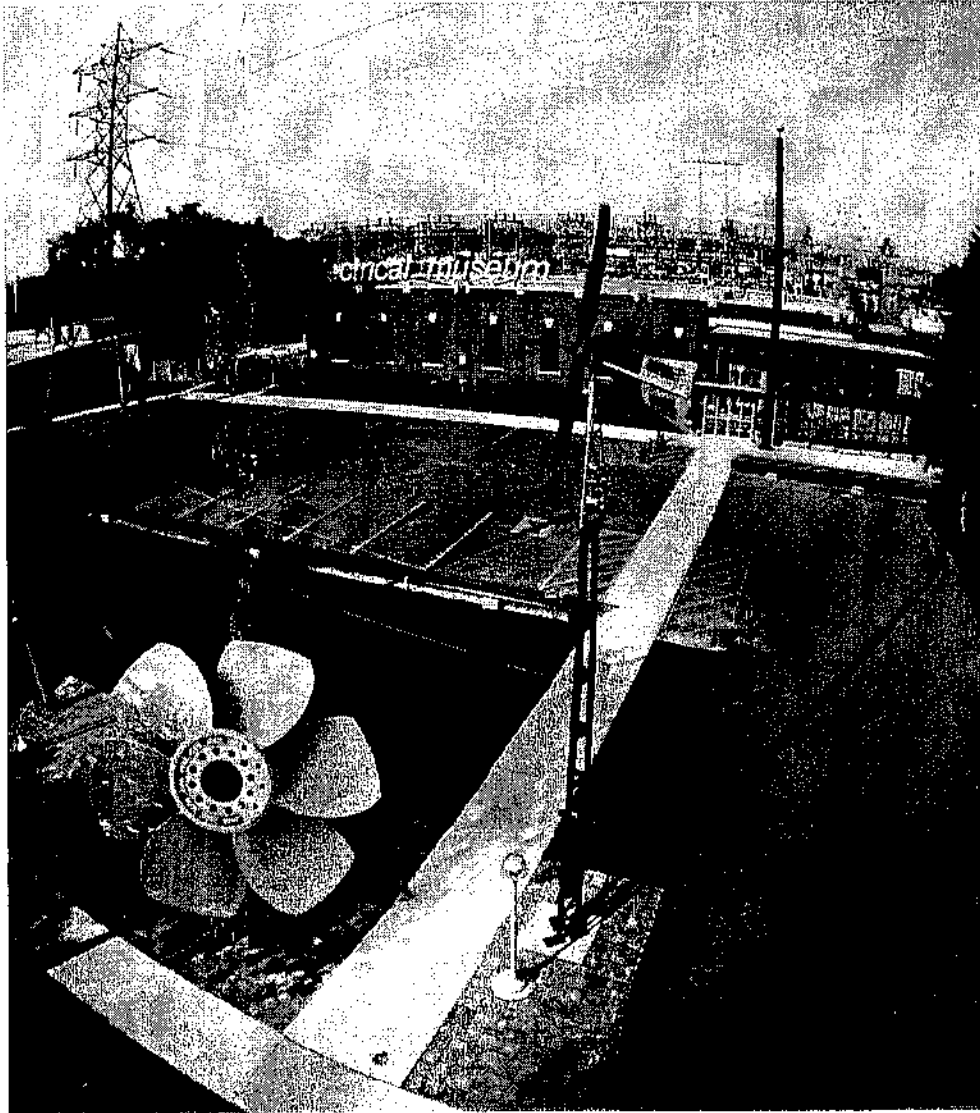
At last, in December 2001, after 30 years and with the help of consultants and - particularly - of Manitoba Hydro, the Manitoba Electrical Museum and Education Centre was officially opened to the public².

The Exhibits

The main floor of the Museum has six themes:

* **Introduction to the Power System:** This theme, in the entrance area, emphasises that water is the

² A photograph of the forecourt and exterior of the Museum has been reproduced on page 4.



Forecourt and Exterior of the Museum

(In the left foreground is the turbine runner from the Great Falls Generating Station)

major fuel that produces Manitoba's electricity. On display is a map of all the drainage basins in North America - and a view of the old control room.

* **The Light Goes On, 1882-1900:** This one is devoted to the years before electricity and to those around the turn of the century when electricity from small wood/coal burning power plants was first used to supply streetlights and streetcars. (A mock-up of a 1930s streetcar, which includes many of the original controls and advertising panels, is also on display.)

* **Energizing Manitoba, 1900-1960:** This exhibit includes the hydroelectric development of the Winnipeg River by the Winnipeg Electric Company and City (later Winnipeg) Hydro and artifacts used during the first half of the 20th century. Of particular interest is a 1940s glass bulb mercury arc rectifier used to convert alternating current into direct current for the operation of streetcars and trolley buses. It looks like something out of the movie *Star Wars*!

* **Rural Electrification, 1919-1961:** This theme covers the work done by the Manitoba Power Commission, with emphasis on the electrification of the province and the use of electricity on the farm. This period saw the remarkable connection of 50,000 farms to the system between 1946 and 1956. It also saw the need to produce electricity in coal burning plants at Brandon and Selkirk to meet the rapidly growing load prior to the development of the next stage in supply expansion - by going north.

* **Northern Development, 1960-Present:** The fifth theme covers the development of the northern rivers of the province and the high voltage direct current transmission system required to bring the power south. The emphasis of the exhibit is on the enormous size of the super stations on the Nelson River, as well as on the diversion of the Churchill River into the Nelson and the regulation of the level of Lake Winnipeg.

* **Energy Conservation and the Future:** The final theme emphasises the need for conservation by being "power smart" and looks at future power source options.

All of the themes are supported with bilingual texts, diagrams, computer monitors and artifacts in the form of early electric appliances and electric utility equipment³.

The lower level of the Museum has various "hands-on" pieces of equipment and models to help visitors understand the basic theory of electricity, as well as to demonstrate safety. For presentations and meetings, there is also an auditorium/conference room with "state-of-the-art" equipment, which serves to emphasise the Education Centre aspect of the Museum's title.

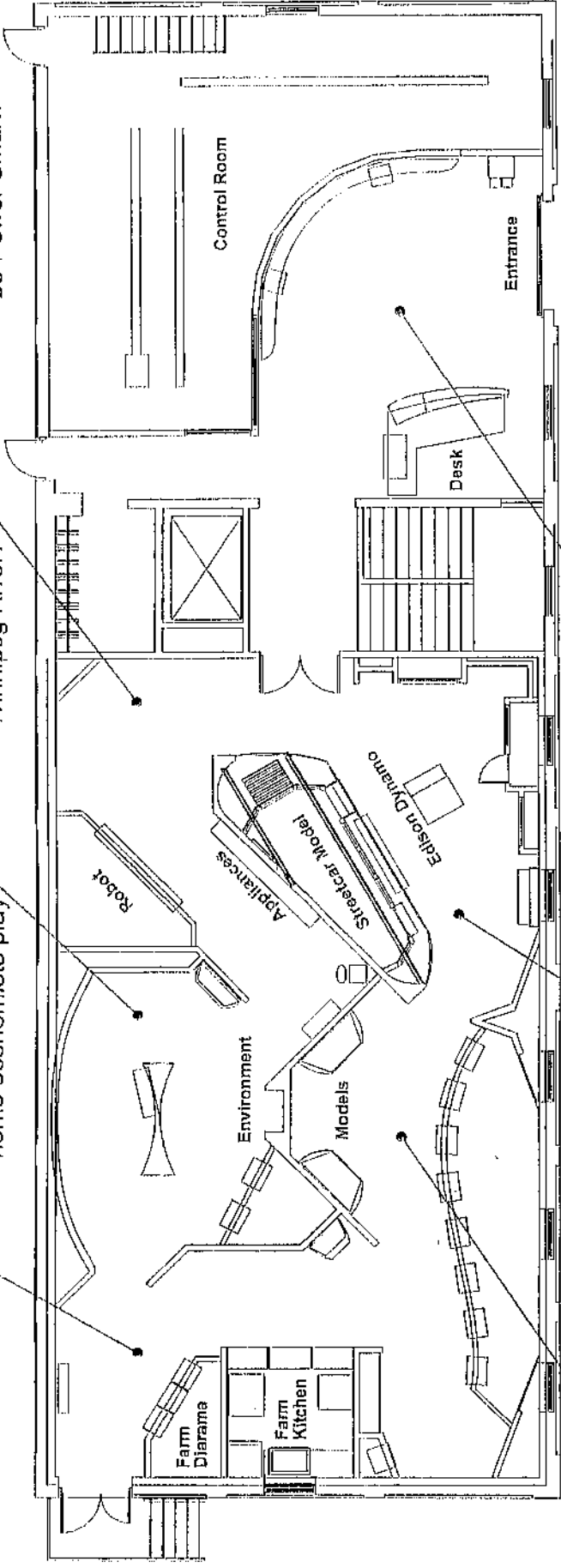
Far and away the largest and most impressive artifact to be "rescued" is a yellow-painted turbine runner from the Great Falls Generating Station that went into service in 1923. Removed after 66 years of operation and replaced by a runner of more modern design, it rests today on a base in front

³ A layout of the upper floor of the Museum and the six theme exhibits is shown on page 6 below.

6. Into the Future
2000-
 What does the electric future hold? How can people conserve energy and what does it mean to be Power Smart?

5. Power from the North
1960-1999
 Which northern river has the potential to provide Manitobans with fifteen times the power of the Winnipeg River?

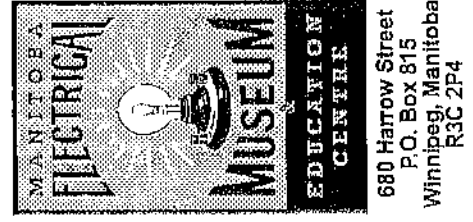
4. Powering up the Farm
1942-1960
 How were the rural regions of Manitoba connected to the provincial power system? What role did home economists play?



3. Energizing Manitoba
1900-1960
 What did early electric appliances look like? How did Manitoba meet the growing demand for electricity?

2. The light goes on
1882-1990
 What did people use before electricity? What was electricity first used for?

1. The Electric Century
1900-2000
 Why is the 20th Century known as the electric century?



of the Museum as a fitting memorial to the men who helped bring electric power to the city of Winnipeg.

The Museum also outlines the corporate history and development of Manitoba Hydro, spanning over 100 years and including both private and public entities, starting in 1873 with a small private gas company (see footnote on page 1 above). Street lighting and streetcars were the early applications and contributed significantly to the expansion of the city of Winnipeg.

When Manitoba Hydro recently acquired Winnipeg Hydro, a whole new treasure house of artifacts, documents and photographs became available for the Museum volunteers to sort and display.

The Museum is always on the look-out for new artifacts to add to the collection and for future display. But at any one time, it can only show a portion of its treasures. It does, however, occasionally change the individual displays. During the first year of operation, some 5000 visitors from across Canada and the United States and around the world were welcomed. The Museum administrator, Jenett Richter summed it up, "We invite everyone to treat their family and their imagination to a trip through Manitoba's electrical history." The volunteers are the lifeblood of the museum and they have had financial and management support from Manitoba Hydro.

In Conclusion....

The man with the vision and dedication to bring this Museum into reality on April 7th 1971, when he was public relations manager with Manitoba Hydro, was Earl Mills. He was supported by Don Baker and Jim Clark. As noted on page 1, the group was initially called the Historical Interest Committee and it came into being because many old electrical artifacts were being donated to Hydro by customers throughout the province. When asked if these should be kept for historical purposes, the answer from the Committee was a resounding "Yes!"

In 1984, after Earl had retired, he proposed that Hydro retirees and other retired electrical industry people should take over the operation of the Committee and that it now be called the Manitoba Electrical Museum. In December 1999 it was incorporated, with the public title it now has.

The volunteers and those who work there also believe that their Museum is "one of a kind." They are proud of what has been accomplished, but are well aware that it represents only the modest beginning. Stored away, and perhaps half forgotten, in many homes and businesses, undoubtedly are many more artifacts related to Manitoba's electrical history. So the search goes on, as do the challenges and opportunities for the years ahead.

Earl Mills died on 22 January 2003, at the age of 87, knowing that his legacy would continue in good hands.

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